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ED 013 938 VT 002 844

PHY 300 PRE-TECHNICAL PHYSICS, COURSE OUTLINE.

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NORTH CAROLINA STATE BOARD OF EDUCATION, RALEIGH

PUB DATE AUG 63

EDRS PRICE MF-$0.25 HC-$0.44 11P.

DESCRIPTORS- *CURRICULUM GUIDES, *VOCATIONAL EDUCATION, PHYSICS, POST SECONDARY EDUCATION, *PRETECHNOLOGY PROGRAMS,

TEACHERS DEVELOPING LESSON PLANS FOR A COURSE IN BASIC PRINCIPLES AND CONCEPTS OF PHYSICS CAN USE THIS OUTLINE. IT WAS DEVELOPED BY A COMMITTEE OF TEACHERS AND WAS BASED ON EXPERIENCE AND CLASSROOM USE. THE OBJECTIVE OF THE COURSE IS TO HELP STUDENTS ACQUIRE AN UNDERSTANDING OF THE SCIENTIFIC APPROACH AND A WORKING KNOWLEDGE OF BASIC LABORATORY PROCEDURES AND EQUIPMENT THROUGH UNITS -- (1) GENERAL LABORATORY PROCEDURES, (2) PROPERTIES AND RELATIONSHIP OF MATTER AND ENERGY, (3) SYSTEMS OF MEASUREMENT, (4) FORCE AND MOTION, (5) FRICTION, AND (6) POWER TRANSMISSION. THE 48-HOUR COURSE IS FOR STUDENTS ENTERING POST-HIGH SCHOOL PRETECHNICAL EDUCATION PROGRAMS WITHOUT BASIC HIGH SCHOOL PHYSICS. THE TEACHER SHOULD BE QUALIFED TO TEACH PHYSICS. THIS MIMEOGRAPHED DOCUMENT LISTS TWO SUGGESTED TEXTS AND TWO REFERENCES. (HC)

PHY 300

COURSE OUTLINE

PHY 300 PRE-TECHNICAL PHYSICS

First Printing
October 1962
Second Printing
August 1963

CURRICULUM LABORATORY
DEPARTMENT OF COMMUNITY COLLEGES
STATE BOARD OF EDUCATION
RALEIGH, NORTH CAROLINA

ACKNOWLEDGMENT

The following course was developed by the Technical Science Committee under the supervision of Roger G. Worthington. The Curriculum Laboratory greatly appreciates the many hours of diligent and dedicated work accomplished by the following instructors:

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Course Description

PHY 300 PRE-TECHNICAL PHYSICS

Comprehensive review covering several of the basic principles of physics. The divisions included are general laboratory procedures, properties and relationship of matter and energy, systems of measurement, force and motion, friction, and power transmission.

COURSE OUTLINE

PHY 300 REMEDIAL PHYSICS

OBJECTIVES: To help the student develop a knowledge of the fundamental principles and concepts of physics. To acquire: an understanding of the "scientific approach"; and a working knowledge of basic laboratory procedure and equipment.

COURSE HOURS PER WEEK: Class, 2; Laboratory , 2.

QUARTER HOURS CREDIT: None.

PREREQUISITE: None.

OUTLINE OF INSTRUCTION:

I. Laboratory procedure

A. Preparation

1. Purpose

2. Selection of proper equipment

3. Relating the experiment

4. Equipment check

B. Collection and recording of data

1. Measurements

2. Use of laboratory notebook or manual

3. Calculations

C. Observations made

D. Conclusions drawn

E. Questions answered

F. Graphical presentations

II. Matter and energy

A. Properties of matter

1. Weight
2. Volume
3. Density
4. Mass and inertia
5. Porosity

B. Forms of matter
1. Solid
2. Liquid
3. Gas

C. Change of form
1. Physical
2. Chemical
3. Nuclear

D. Energy
1. Potential
a. Position
b. Chemical
c. Nuclear
2. Kinetic
a. Electrical
b. Heat
c. Sound
d. Light
e. Mechanical

E. Relation of matter and energy
1. Law of conservation of energy

2. Law of conservation of matter

3. Law of conservation of matter-energy

III. Measurement

A. Fundamental units

1. Length

2. Mass

3. Time

4. Temperature

5. Electric charge

B. Secondary units

1. Area

2. Volume

3. Density

C. Systems of measurement

1. English

a. Foot-pound-second

b. Foot-slug-second

2. Metric

a. Meter-kilogram-second

b. Centimeter-gram-second

3. Conversion factors

IV. Force and motion

A. Force

1. Definition

2. Units

3. Measurement

4. Vectors

5. Composite forces

a. Acting in a straight line

b. Acting at right angle

c. Acting at any angle

d. Three or more forces acting at a point

e. Problem solving

(1) Graphically

(2) By trigonometry

B. Friction

1. Nature

a. A help

b. A hindrance

2. Types

a. Starting

b. Sliding

c. Rolling

3. Coefficient of friction

4. Changing friction

a. Increasing

b. Decreasing

C. Motion

1. Linear

a. Speed

b. Velocity

c. Acceleration

(1) Uniform

(2) Equations

2. Newton's laws

a. Law of inertia

b. Law of acceleration

(1) Metric unit

(2) English units

c. Law of action and reaction

3. Impulse and momentum

4. Rotary motion

a. Centripetal force

b. Centrifugal force

c. Angular measurement

d. Angular velocity

e. Angular distance

f. Torque

g. Power transmission

5. Periodic motion

a. Work of Galileo

b. The pendulum

(1) Period

(2) Uses

SUGGESTED TEXT: Select one.

Dull, Charles E., Metcalfe, H. Clark and Brooks, William O. Modern Physics; New York: Henry Holt and Company, 1955.

White, Harvey E. Physics-An Exact Science. Princeton: D. Van Nostrand Company, Inc., 1959.

SUGGESTED REFERENCES:

Harris, Norman C. and Hemmerling, Edwin M. Introductory Applied Physics. New York: McGraw-Hill Book Company, Inc., 1955.

Marcus, Abraham. Physics For Modern Times. Englewood Cliffs; Prentice-Hall, Inc., 1959.